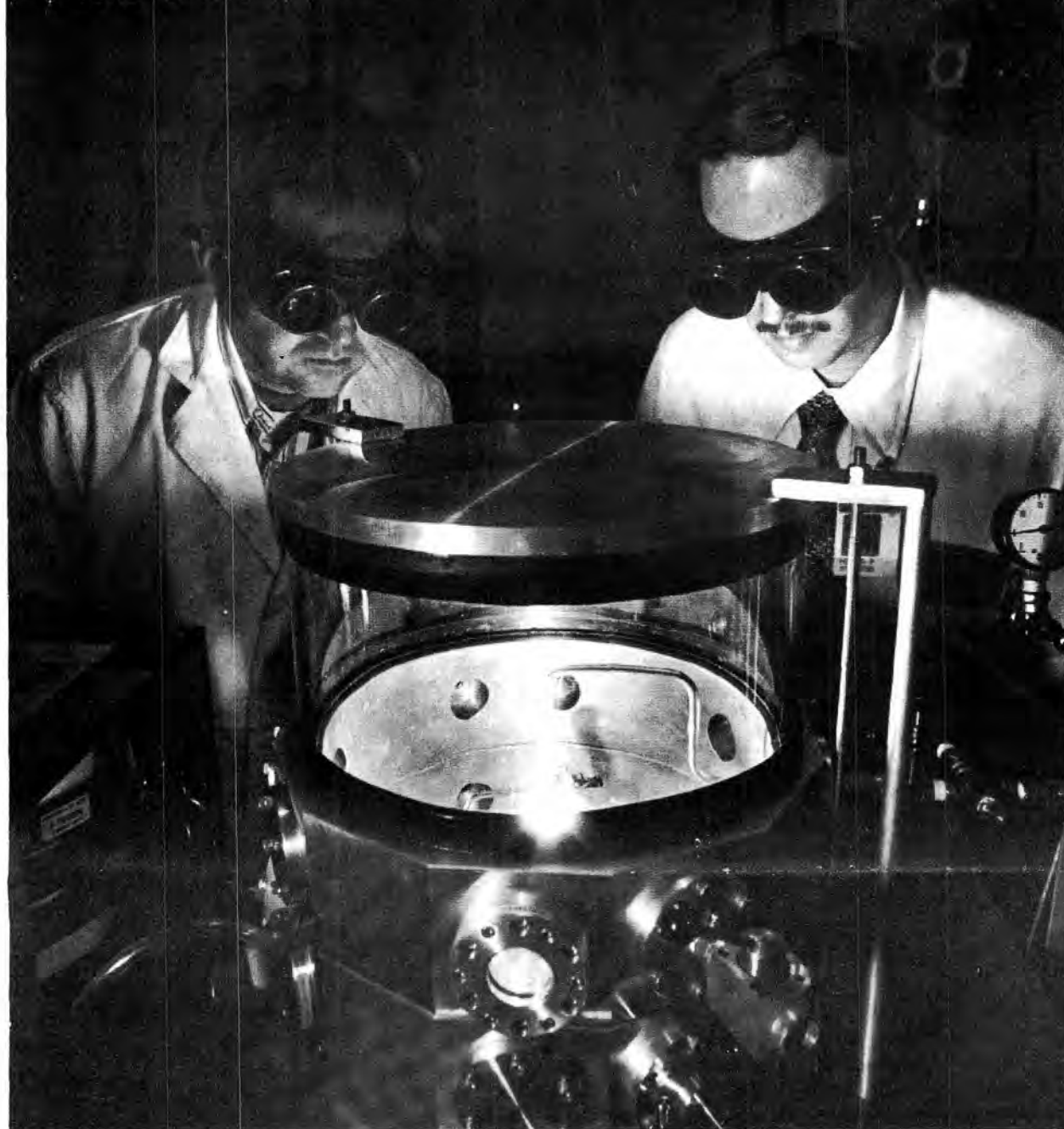


# LAB NEWS

JUNE 15, 1973

VOL. 25, NO. 12



FLOATING inside a coiled induction furnace which creates a magnetic field and extreme temperatures, a sample of uranium is heated to 2400° K by Tom Tormey, left, and Howard Stephens (both 5322). The apparatus, designed by the Sandians, is called a liquid argon calorimeter and is used to measure enthalpy of high-temperature metals.

## The Magic Word Is Levitation

The word "levitation" is often associated with a magician's mysteriously causing an object, usually a pretty assistant, to float in the air, defying belief and the law of gravity.

But Howard Stephens and Tom Tormey of High Temperature Materials Properties Division 5322 use levitation of material samples with a new measurement technique, liquid argon calorimetry, to determine the enthalpy of the sample. (Enthalpy: a thermodynamic quantity relating to the heat content of a body.)

Currently, the experiments involve heating uranium to temperatures up to 2400°K (3900°F), about 1000°K above its melting point and just short of extensive vaporization. Uranium, a highly corrosive and difficult to handle material, reacts with most other materials, especially at such extreme temperatures. There is no known container that would hold the sample without contaminating it. Levitation inside an argon filled chamber solves this problem.

Heating and levitation are achieved simultaneously with a coil powered by a high frequency induction furnace. Argon, an inert gas, prevents contamination of the sample. Up to 5000 amperes of current at 450 kilohertz flows through the coil, creating an intense magnetic field in which the sample is suspended and quickly heated to high temperatures. An automatic pyrometer measures the temperature.

When power to the coil is shut off, the heated sample drops through a high speed valve into the calorimeter containing liquid argon. The valve is designed to operate in the millisecond range as the sample falls through.

The hot liquid uranium is rapidly cooled by the liquid argon at 85°K (-300°F). The heat from the uranium vaporizes a portion of the argon. The escaping gas is measured by a flow meter and, from this measurement, the heat content of the sample can be precisely calculated.

The experimental work is directly related to that aspect of metallurgy which is concerned with heat transfer characteristics during casting and cooling. • dg

## How About Turning Off?

When you leave your office/lab/shop at night, do you turn off the lights? Most people don't and, until recently, it didn't make much difference. But the country faces a fuel and power shortage and, although no immediate problem is foreseen locally, prudence and thrift suggest a few simple steps:

- turn off lights at the end of the day or if you will be gone for more than an hour.
- experimenters should turn off power (and water) to those portions of long-duration experiments no longer needing these elements.
- swamp coolers and other individual air conditioners should be turned off at the end of the day.

- outside lights are usually controlled by a nearby switch; if you see one burning during daylight hours switch it off (cost of automatic shut-offs is very high).

Ward Hunnicutt, manager of Plant Engineering Dept. 7550, notes that water use can also contribute to the energy shortage. Hot water requires electricity, natural gas or fuel oil for heat, and electricity is needed to pump hot and cold water. And water is, after all, a precious commodity. So turn that faucet or valve off when not in use.

Got any ideas about how the Labs could practice conservation in this or other areas? Ward urges you to send them to his office — they'll be given careful consideration.



THIS is Robert Scott, who succeeds Laddie Otoski as Manager of the AEC/ALO Sandia Area Office. Previously he was Director of the ALO Budget Division.

# Afterthoughts

Of Busses, Bicycles, Gas Shortages, & Pollution--Concerned about smog, LAB NEWS several years ago undertook to get Sandians to form car pools. Initially we tried persuasion, later some rather elaborate computerized matching of employees who lived near each other. Our success was never more than exceedingly modest. At least three-quarters of Sandians continue to come to work as lone rangers--one person, one car. But now we sense change in this bleak picture, brought about--we guess--by all the chatter about gas shortages. The Sandia commuter bus program, which drifted along for years at a low ebb, has suddenly taken off, and the LAB NEWS office sounds like an outpost of the Albuquerque Transit Company (for whatever reason writer Bruce Hawkinson is now Bus Honcho for Sandia Labs). And one begins to see on bicycles certain people, very straight, very dignified, who just didn't seem to be the type you could get on a bike. It's also apparent that bike traffic has increased significantly, on Base and elsewhere. It would be ironic if the "gas shortage" is behind all this, because for most of us the shortage is a fiction--how many times have you not been able to buy gas?

\* \* \*

"The people have always some champion whom they set over them and nurse into greatness. This and no other is the root from which a tyrant springs; when he first appears he is a protector." Plato, The Republic

\* \* \*

And Speaking of Bikes--Sandia's young ladies who are concerned about the propriety of riding a bike to work will be reassured by this passage: "The alarmingly pessimistic view of the bicycle question is not justified by the facts. It is doubtless true that many young women ride to excess. It is also doubtless true that to the woman of impure life the wheel may offer a convenient means for facilitating the execution of immoral designs, but that the pastime itself has a tendency to degrade or demoralize is a proposition too absurd for a moment's consideration. A woman who will violate the decencies and proprieties of life while wheeling will violate them on other occasions. Where one woman rides to destruction on the wheel a thousand maintain all the decorum, modesty, and circumspection that characterize the well-bred, self-respecting women from the ideal American homes." (from an 1896 edition of the Chicago Times-Herald)

\*js

# Events Calendar

- June 15-17 — "Aaron Slick from Punkin' Crick," summer stock at Fine Arts Learning Center, U of A, 8 p.m.
- June 15-17, 21-24 — Corrales Adobe Theater, "The Fantasticks," June 29-July 1 — T.S. Eliot's "The Cocktail Party," 8:30 p.m.
- June 15-17, 21-24 — Old Town Studio, "Play It Again, Sam," 8 p.m.
- June 16 — NM Mt. Club, Sandia Flower Hike, Western Skies, 8 a.m.
- June 16-17 — The Mime Experiment, "The Follies of Arlechino," 1 and 7 p.m., Old Town Plaza; June 23-24 — at Bataan Park, 5 p.m.
- June 17 — Velo Bike Club, riders from all over have entered the annual Madrid to Sandia Crest race. Spectators welcomed. Starts at 9 a.m.
- June 18 — Santa Fe Opera box office opens at KHFM radio, 5900 Domingo Rd. NE, 10 a.m. - 6 p.m., all summer.
- June 22-24, 29-30, July 1, 6-7 — Albuquerque Civic Light Opera presents "South Pacific," Popejoy Hall, 8:15 p.m.
- June 22-24 — "Oh Dad, Poor Dad, Mama's Hung You in the Closet and I'm Feelin' So Sad!," U of A, 8 p.m.
- June 23 — Fiesta of San Juan, San Juan Pueblo.
- June 23 — NM Mt. Club, Lake Peak via Windsor Trail, Gulf Mart, 8 a.m.
- June 24 — Sandia Bike Ass'n., tour to Los Lunas via State Rd. 6, meet at I-40 and Rt. 6 at 9 a.m.
- June 24 — San Juan Fiesta Corn Dance and Rabbit Hunt, Taos Pueblo.
- June 29-July 1 — N.M. Arts and Crafts Fair, State Fair Grounds.
- June 29-July 1 — "Day of Resurrection" at Fine Arts Learning Center, U of A, 8 p.m.
- June 29 — San Pedro Fiesta: Acoma, San Felipe, Santa Ana, and Santo Domingo Pueblos.
- June 29 — Return of LAB LEWS
- June 30 — First Annual Arroyo Flush and Mosquito Branding, Jal, N.M. Reservations required.
- June 30 — New (Fiscal) Year's Eve Celebration — 11:55 p.m. No cover; no minimum; no money left.

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LAB NEWS  
JUNE 15, 1973



## LAB NEWS

Published every other Friday

### SANDIA LABORATORIES

An Equal Opportunity Employer  
ALBUQUERQUE, NEW MEXICO  
LIVERMORE, CALIFORNIA  
TONOPAH, NEVADA

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john shunny is editor  
&  
don graham ass't. editor

bruce hawkinson writes  
as does norma taylor while  
bill laskar takes/makes pictures  
&  
in livermore lorena schneider does all



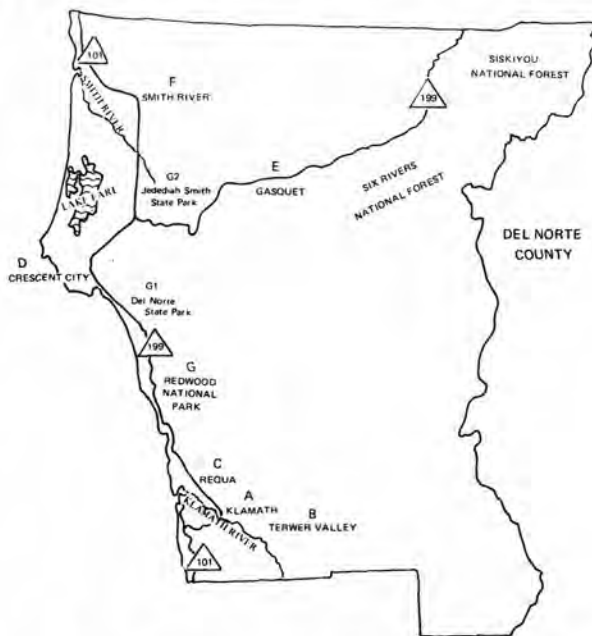
THESE TWO EXECUTIVES came to Sandia Labs in June. Charles Ross (left) returns as Sandia's General Attorney, Secretary and Treasurer (6000) after a stint with WE in New York. At right is William Spencer, the Labs' new Director of Microelectronics (2100), who comes here from Bell Labs; Bill spent a summer at Sandia back in the 50's while working on his PhD at Kansas State.

## Touring Northern California

More than half of Del Norte County, 370 miles north of San Francisco on Highway No. 101, lies in the national park and federal or state forest systems. The area offers recreational activities as well as natural, scenic and historic attractions.

These sites are especially noteworthy (see map):

- A. Klamath. Famed salmon, steelhead and trout fishing; annual Salmon Festival each June; jet-boat sightseeing trips and steam train rides, summer; wilderness area located upstream from Klamath; area rich in Indian lore; "Trees of Mystery" redwood attraction, including Paul Bunyan's "Trail of Tall Tales," and Indian museum.
- B. Terwer Valley. Resort; historical site of old Fort Terwer.
- C. Requa. Probably oldest California "residence" here, the Yurok Indian family house built of redwood slabs hewn with elkhorn wedge; scenic river trips.
- D. Crescent City. Del Norte County Historical Society Museum; McNulty Pioneer Memorial Home; Undersea Gardens featuring marine life in natural environs and scuba diver show; citizen's dock for pier fishing, where fishing fleet unloads catches of salmon and crab; processing plant tours; Battery Point museum in 1856 lighthouse; "Brother Jonathan" cemetery commemorating century-old shipwreck; sawmill tours and demonstration forest at Miller-Rellim Redwood Plant.
- E. Gasquet. Fishing and recreation area with resorts, campgrounds and picnic areas.
- F. Smith River. Great fishing stream; jade hunting on nearby beaches; lily and daffodil growing area.



G. Redwood National Park. Newest national park; 58,000 acres (46 miles along coast) of redwood forest, bluffs and beaches; offers naturalist program during summer; headquarters at 501 H Street, Crescent City. It includes:

1. Del Norte Redwoods State Park. 6375 acres of redwood groves, spectacular beach with tidal pools, crashing surf; office at Mill Creek campground.
2. Jedediah Smith Redwoods State Park. Ten memorial redwood groves, including Stout Memorial Grove (Stout tree, 340-ft. tall); office in Hiouche on U.S. Highway No. 119.

Facilities information on these areas may be obtained from Public Relations Division 8235.

## Take Note

Inspector Brent Loomis of Burns Security Agency at Sandia/Livermore took the third-place trophy in the San Francisco area pistol event held at Site 300's outdoor range near Livermore. Brent's win qualifies him as a member of a four-man team which will be representing AEC/SAN at the second annual AEC National Pistol Tournament at Oak Ridge, Tenn., this summer. Other inspectors from Burns' SLL security force who competed at the Site 300 event were Michele Crossen, Mike Upton and Lt. Jim Shackouls.

## Authors

Ray Mar (8314) and N.D. Stout (LLL), "High Temperature Enthalpies of Binary Dodecaborides," JOURNAL OF CHEMICAL PHYSICS, Vol. 57, pp. 5342-5349.

Ray Bertolotti (8312), "Fracture Toughness of Polycrystalline  $Al_2O_3$ ," JOURNAL OF AMERICAN CERAMIC SOCIETY, Vol. 56, No. 2, p. 107.

Mike Baskes (8314) and Tony Thompson (8313), "Relation Between Apparent and True Activation Area," JOURNAL OF APPLIED PHYSICS, Vol. 44, p. 892.

Tony Thompson (8313), "On Fatigue Crack Morphology at Surfaces," SCRIPTA METALLURGICA, Vol. 7, p. 211.

Charlie Landram (8111), "Heat Transfer During Vessel Discharge: Mean and Fluctuating Gas Temperature," ASME JOURNAL OF HEAT TRANSFER, Series C, Vol. 95, No. 1, pp. 101-106.

Ken Henry (8314) and E.B. Royce, D.J. Steinberg and D.R. Stephens (all LLL), "A Technique for Measuring Equilibrium Thermodynamic States of Liquid Metals in High Temperatures and Pressures," REVIEW OF SCIENTIFIC INSTRUMENTS, Vol. 43, No. 12, p. 1777.

Hartmut Spetzler and Marshall Meyer (both 8314), "An Equation-of-State of Molten Metals by Holographic and Ultrasonic Interferometry," TRANSACTIONS OF AMERICAN GEOPHYSICAL UNION, Vol. 53, No. 11, p. 1121.

## Death

Ruth Dunker of Engineering Services Division 8433 died May 6 after a long illness. She was 56.

She had worked as a service clerk at Sandia/Livermore since Feb. 1960.

Survivors include her husband, two sons, a brother, and two grandchildren.

# LIVERMORE NEWS

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## Sympathy

To Esther Rickert (8256) on the death of her mother in Ewing, Nebr., May 18.

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STUDENTS VISIT SANDIA/LIVERMORE. Granada High School students visited the Labs recently in connection with a program to promote electrical and electronics engineering among high school students. Clarence Loveless (8423),



above left, describes the telemetry lab while Gordon Kibby (8421), photo at right, was host in the electronic fabrication lab.

## Authors

L.C. Beavis (2413), "Interaction of Hydrogen with the Surface of Type 304 Stainless Steel," Vol. 10, No. 2, THE JOURNAL OF VACUUM SCIENCE AND TECHNOLOGY.

W.P. Bishop (1112), "Poly(halo)styrene Thin-Film Dosimeters for High Doses," Vol. 44, No. 4, THE REVIEW OF SCIENTIFIC INSTRUMENTS.

J.E. Houston, R.L. Park (both 5114) and G.E. Laramore (5151), "Direct Comparison of Core-Electron Binding Energies of Surface and Bulk Atoms of Ti, Cr, and Ni," Vol. 30, No. 18, PHYSICAL REVIEW LETTERS.

J.M. Peek (5211), "Theory of Quasibound States. Comparison with Experiment for HeH<sup>+</sup> Isotopes," Vol. 64, No. 1, PHYSICA.

J.P. Van Dyke (5151) and H.T. Weaver (5154), "Nuclear Magnetic Resonance Measurements and the Energy Band Structure of PtSn," Vol. 12, No. 9, SOLID STATE COMMUNICATIONS.

L.C. Bartel (5151), "Modified Zener Model for Ferromagnetism in Transition Metals and Alloys — Model Calculations of Tc," Vol. 7, No. 7, PHYSICAL REVIEW B.

P.A. Miller and G.W. Kuswa (both 5242), "Plasma Heating by an Intense Electron Beam," Vol. 30, No. 20, PHYSICAL REVIEW LETTERS.

C.J. MacCallum (5223) and T.A. Dellin (8341), "Photo-Compton Currents in Unbounded Media," Vol. 44, No. 4, JOURNAL OF APPLIED PHYSICS.

W.J. Camp (5151), "Decay of Order in Classical Many-Body Systems. III. Ising Model at Low Temperature," Vol. 7, No. 7, PHYSICAL REVIEW B.

P.J. Chen (1540) and W.E. Warren (5121), "Wave Propagation in the Two Temperature Theory of Thermoelasticity," Vol. 16, No. 1-2, ACTA MECHANICA.

J. Lipkin, J.C. Swearingen and C.H. Karnes (all 5165), "Mechanical Properties of 6061 Al-Mg-Si Alloy After Very Rapid Heating," Vol. 21, No. 2, JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS.

G.J. Scrivner (formerly 1935) and D.L. Mangan (2115), "On Approximating the EMP Response of Small Cavities," Vol. NS-20, No. 2, NUCLEAR SCIENCE.

E.J. Nowak (2413), A.J. Max (2415), and J.K. Maurin (5522), "Investigation of the Effects of Heating in CO<sub>2</sub> of the Oxide-Coated Cathode Surface Microtopography and Emission Characteristics of a Triode Electron Tube," May/June issue, JOURNAL OF VACUUM SCIENCE AND TECHNOLOGY.

R.T. Meyer, A.W. Lynch and J.M. Freese (all 5324), "Chemical Reactions of Carbon Atoms and Molecules from Laser Induced Vaporization of Graphite and Tantalum Carbide," Vol. 77, June issue, JOURNAL OF PHYSICAL CHEMISTRY.



DISPLAYING NEW DEVICE, a light-trapping cell which intensifies a laser beam, are inventors Ron Hill (5642), left, and Danny Hartley (8354).

### For Raman Spectroscopy

## 'Light-Trap' Increases Laser Beam Intensity

Danny Hartley (8364) and Ron Hill (5642) have devised a way to make a laser beam pass through the same point many times so that the beam is intensified by almost a factor of 100.

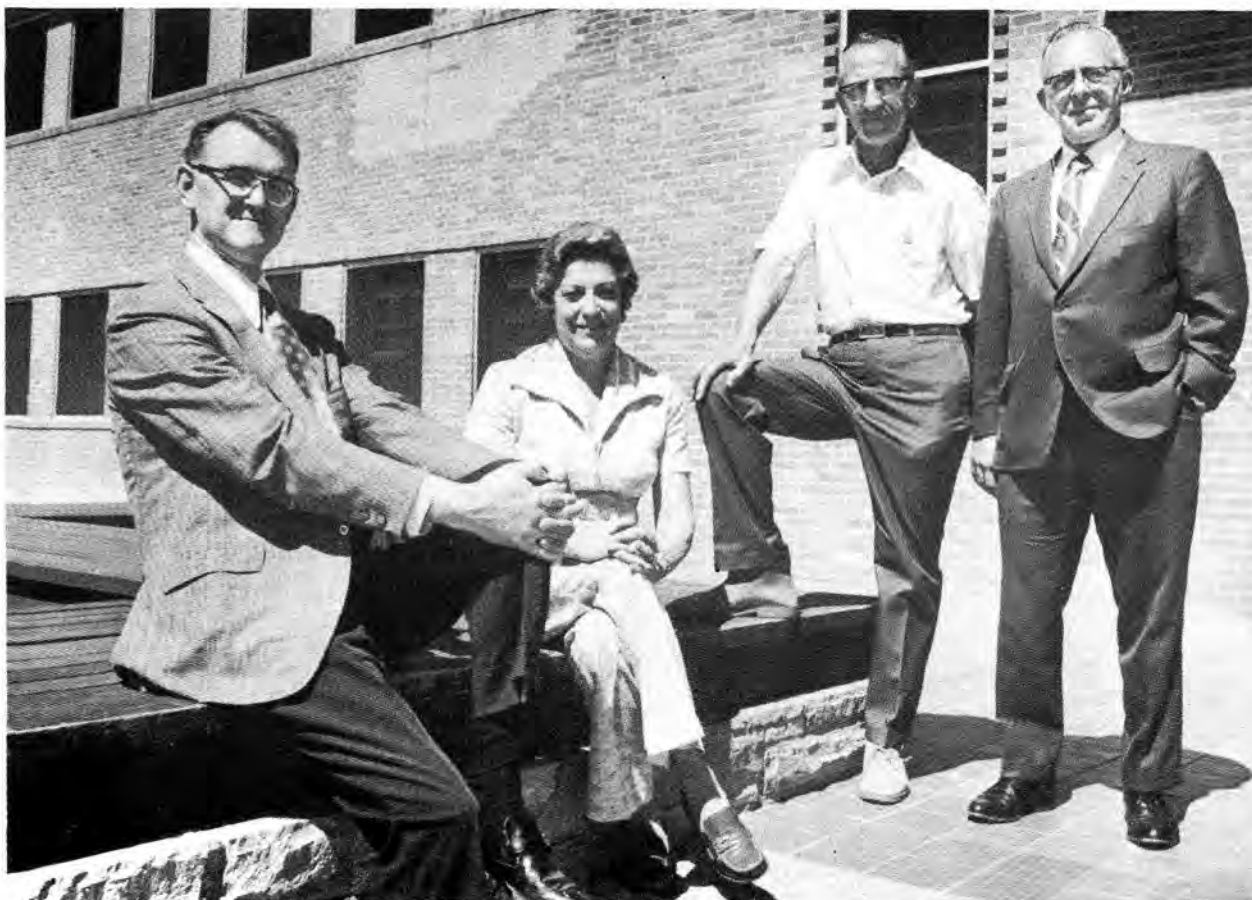
The device, essentially a light-trapping cell resembling an optical resonator cavity, employs the unique properties of an ellipsoidal mirror — light brought to one focus will be reflected alternately through the two foci and will eventually collapse to the major axis. A flat mirror is positioned halfway between the two foci of the ellipsoid so that one focal point is actually behind the flat mirror. The beam is reflected repeatedly between the two mirrors and concentrates at the one focus in the cell.

A spherical mirror, co-axial with the flat mirror re-directs light leakage due to magnification back into the cavity via an inverted path. This spherical mirror is responsible for increasing the gain to 100. Earlier models without this mirror were only able to achieve light gains of about 23.

The new device has proved to be a useful tool in gas flow and plasma studies.

By having a gas sample at the focal region of the light cell, Raman spectroscopy (in which individual gases are identified by discrete wavelength shifts in the scattered light) may be performed with conventional detection apparatus. Light scattered from gas molecules in the focal region is analyzed with a spectrophotometer that records the spectral lines present. This new device allows Raman spectroscopy to be carried out at conditions that were previously impossible.

Ron Hill is supervisor of Experimental Aerophysics Division 5642. Danny Hartley heads Aerodynamics Division 8364 at Livermore. The men originated the concept for the light-trapping cell while attending a conference in Washington, D.C. • dg



RETIRING at the end of this month are (l to r) Craig Hudson (1150), Amy Anez (3521), Roy Buckner (5165), and Clarence Meyer (1133).

## Join the Payroll Savings Plan.



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## Speakers

E.E. Ritterbush (4210), "HMO Experiences and Expectations," N.M. Public Health Ass'n., May 1, Albuquerque.

G.W. Hughes (9474), "Visual Tracking of Artificial Satellites," Duke City Civitan Club, May 1; "The Metric System and the Citizen," Civitan West Club, May 17.

H.C. Monteith (9344), "ESP Research in Russia, England, and America," Adult Fellowship Group - First Presbyterian Church, May 6; Manzano Kiwanis Club, May 15; Los Altos Kiwanis Club, May 24; "Creativity," Duke City Civitan Club, May 15; "Psychology and Happiness in Human Relations," Sandia Civitan Club, May 18.

C.S. Johnson (9421), "Did They Understand What You Wrote?" Creative Writing Class, Del Norte H.S., May 7.

O.L. Wright (7220), "History of Sandia Base," Duke City Civitan Club, May 8.

C.A. Pepmueller (3144), "Sharing Our Information Resources," Albuquerque Breakfast Lions Club, May 10.

R.E. Smith (1642), "Mechanical Engineering," Career Education Workshop, Del Norte H.S., May 15.

R.M. Jefferson (5222), "Nuclear Engineering," Career Education Workshop, Del Norte H.S., May 17.

N.J. Pollard (2342), "Electrical Engineering," Career Education Workshop, Del Norte H.S., May 17.

H.H. Patterson (1230), "Mexico and the Sea of Cortez," Downtown Optimist Club, May 18.

H.R. Shelton (3132), "You're OK, I'm OK," Duke City Civitan Club, May 22.

B.C. Kayate (9532), "Pueblo Life - An Overview," Southwestern Literature Class Highland H.S., May 29.

R.C. Colgan (3153), "Film and Video Tape at Sandia," WE-AT&T TV Workshop, Corporate Education Center, May 23, Princeton, N.J.

D.B. Longcope (5722, DSP), "Pulse Propagation in an Inhomogeneous Medium," Solid Mechanics Seminar, May 31, Stanford Univ.

L.M. Jercinovic (9540), "Working Alone in the R&D Laboratory," R&D Safety Symposium, Univ. of Tenn., May 7-8, Tullahoma.

J. Lipkin (5165), "Dynamic Yield Strength Determination at Elevated Temperatures After Nanosecond Pulse Heating," SESA International Congress on Experimental Mechanics, May 13-18, Los Angeles.

T.J. Tucker (5131), "The Spark Sensitivity of Secondary Explosives and EBW-Type Detonators," Electrostatic Hazards Meeting, May 23-24, Picatinny Arsenal.

L.V. Rigby (1642), "Plans for the Future of ASQC," White Sands Section, ASQC, May 25, El Paso.

R.L. Coats (5221), "High Yield Single Pulse Systems," Workshop on Intense Neutron Sources (WINS), May 30-June 1, Upton, N.Y.

E.L. Patterson and R.S. Gerber (both 5212), "High-Energy HF Laser Initiated by an Intense Electron Beam," IEE/OSA conference on Laser Engineering and Application May 20-June 1, Washington, D.C.

J.G. Webb and R.J. Chaffin (both 2122), "Power Transistor Amplifier Design Using Large-Signal S-Parameters," Chaffin and W.H. Leighton, "Large-Signal S-Parameter Characterization of UHF Power Transistors," IEEE G-MTT International Microwave Symposium, June 4-6, Boulder, Colo.

L.S. Nelson (5324), "Measurement of Carbon Vapor Pressure and Formation of Liquid Carbon at Low Pressure by Laser Heating"; R.M. Curlee and M.L. Lieberman (both 5313), "Pyrocarbon Formation from Benzene in the Preparation of Carbon/Carbon Composites"; Curlee and D.A. Northrop (5313), "Properties of Carbon/Carbon Filament Wound Composites with Laminar and Isotropic Matrix Microstructures"; Lieberman and H.O. Pierson (5313), "Effect of Gas Phase Conditions on Resultant Matrix Pyrocarbons in Carbon/Carbon Composites"; Pierson, Northrop and J.F. Smatana (5313), "Development and Properties of PAN-Based Carbon Felt-Pyrolytic Carbon Composites"; Lieberman and G.T. Noles (5313), "Kinetic Factors in the Chemical Vapor Deposition of Carbon from Methane"; B. Granoff and M.P. Apodaca (both 5313), "Effects of Compaction on the Properties of Carbon Felt-Carbon Matrix Conical Frusta"; B.L. Butler and J.C. Tidmore (both 5313), "Restrained Thermal Expansion Behavior of ATJ-S and Some Carbon Fiber/Pyrocarbon Matrix Composites"; R.T. Meyer (5324), "Pulsed Laser Induced Vaporization of Graphite and Carbides," 11th Biennial Conference on Carbon, June 4-8, Gatlinburg, Tenn.

J.A. Horak, D.J. Sasmor (both 5221) and M.M. Karnowsky (5531), "Nondestructive Testing of Pulsed Reactor Fuels"; Horak and Sasmor, "Mechanical Properties of a Potential Pulsed Reactor Fuel, U-6, w/o Mo"; L.D. Posey (5226), "Rate Saturation Effects in Passive Dosimetry Materials"; J.H. Renken, K.G. Adams and F. Biggs (all 5223), "The DINT Computer Code"; R.R. Boade (5323), "Effects of Material Porosity on Pressure Generation"; T.R. Schmidt and

## Supervisory Appointments



BOB HUGHES to supervisor of Physics of Organic Solids Division 5514, effective June 1. Bob has been with this organization since joining the Labs in June 1966. His work has included investigation of the electric and magnetic properties of organic semiconductors and study of x-ray induced photoconductivity of organic insulators.

Bob earned a BA degree from Carleton College in Northfield, Minn., and a PhD in physical chemistry from Stanford University. He is a member of The American Physical Society, and Phi Beta Kappa and Sigma Xi honorary societies. He is also a hiking and skiing enthusiast.

Bob, his wife Laura and their two children live at 1416 Mesilla, N.E.

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PETE RICHARDS to supervisor of Structural Phenomena in Solids Division 5132, effective June 1. Since joining Sandia in June 1971, Pete has worked in this division - doing research in the magnetic properties of solids.

Before coming to the Laboratories, Pete was a physics professor at the University of Kansas. He earned a BS degree from Massachusetts Institute of Technology in 1957 and a PhD from Stanford University in 1962.

Pete is a member of the American Physical Society, Sigma Xi honorary society, and the Albuquerque Association for Children with Learning Disabilities. His favorite off-the-job activity is long distance running.

Pete, his wife Bette and their three children live at 7716 Northridge, N.E.

J.A. Reuscher (both 5221), "Reflector Burst Experiment with SPR II," American Nuclear Society Meeting, June 10-15, Chicago.

C.W. Frank (5511), "Excimer Formation and Energy Migration in Vinyl Polymers," Molecular Spectroscopy Symposium, Ohio State Univ., June 11-15, Columbus.

R.C. Hughes (5514), "Transient X-Ray-Induced Conductivity in Single Crystal Quartz"; D.M. Mattox (5526), "Thin Film Metallization of Oxides"; J.C. King (2500) and H.H. Sander (2113), "Rapid Annealing of Frequency Change in High Frequency Crystal Resonators Following Pulsed X-Irradiation at Room Temperature"; J.C. King and E.F. Hartman (2115), "Calculations of Transient Thermal Imbalance Within Crystal Units Following Exposure to Pulse Irradiation," Annual Frequency Control Symposium, June 12-14, Atlantic City, N.J.

R.P. Clark and F.W. Reinhardt (both 2523), "Thermal Decomposition of Zinc Chromates"; W.P. Schimmel, Jr. and A.B. Donaldson (both 1543), "Analytical Consideration of the Distribution Error in a Twin-Bridge Isothermal Calorimeter"; H.P. Stephens (5322), "Measurement of the Enthalpy of Liquid Uranium with a Liquid Argon Calorimeter," Annual Calorimetry Conference and Annual North American Thermal Analysis Society Meeting, June 13-15, Worcester, Mass.

G. Yonas (5242), "Applications of High Intensity Relativistic Electron Beams to Ion Acceleration," Lecture at International Summer School of Laboratori Nazionali Di Frascati, June 5-16, Erice, Sicily.

D.F. McVey (5626), "Analysis of Deployment and Inflation of Large Ribbon Parachutes"; D. Wolf (5626), "A Simplified Dynamic Model of Parachute Inflation"; W.B. Pepper (5626) and J.R. Biesterveld (1253), "A Guided Gliding Ribbon Parachute and Control System," Aerodynamic Deceleration Systems Conference, May 21-23, Palm Springs, Calif.



ALICE MINER to supervisor of Payment Control & Accounting Section 4154-3, effective June 1. Alice was employed by Sandia in July 1963 as a secretary steno. Since then she has worked as an engineering release editor, employment clerk, personnel placement clerk, staff assistant in personnel, staff member in purchasing and, since May 1971, has been with her present organization.

Alice earned a BBA degree in 1956 from UNM. In September 1968 she was granted a fellowship from UNM and a leave of absence from Sandia and received her MBA in 1969.

She is treasurer of the Coronado Ski Club, a member of a Thespian group, is active in Little Leagues, and belongs to the parents group of the Sandia Peak Junior Ski Racers.

Alice's husband Leroy is purchasing agent for Gulton Ind. They and their two sons live at 1021 Santa Ana, S.E.

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BOB GUERRERO to supervisor of Payment Processing Section 4154-2, effective June 1. Joining the Labs in December 1951 as a material handler, Bob has worked in office services division, plant accounting and, for the past 16 years, in accounts payable division.

Bob has studied business at Fort Scott Junior College (Fort Scott, Kans.) and at the University of Albuquerque. He is a graduate of the International Accountants Society of America. He served in the U.S. Army from 1948-51 and was stationed at Sandia Base. He is involved in Youth Basketball and Little League Baseball.

Bob, his wife Rosemarie and their three children live at 9528 Elvin, N.E.

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LARRY SHAMPINE to supervisor of Applied Mathematics Division 5121, effective June 1. Larry first joined the math department at Sandia in August 1964. He left the Labs in 1969 to become a math professor at UNM. During his time at UNM, he wrote a book entitled "Numerical Computing: An Introduction," which was published last May by W.B. Saunders Publishing Company. Larry returned to Sandia in July 1972. He is performing numerical analysis research for a forthcoming book, "Computer Solution of Ordinary Differential Equations."

Larry's degrees - undergraduate and PhD in mathematics - were awarded from the California Institute of Technology. He is a member of the Society for Industrial and Applied Mathematics. The Shampines are avid art collectors, mainly graphics, and also enjoy ballroom dancing.

Larry and Joanna have four-and-a-half year old twin boys - born on Christmas Day (Larry says you wouldn't believe what a big day that one is each year!). They live at 2120 Valencia, N.E.



STARTING MONDAY, that air-conditioned coach back there will be a Los Lunas-Sandia commuter bus. Bruce Hawkinson of LAB NEWS, left, and Bob Martin (2115, right) arranged the two-week trial period with Leo Sanchez, owner of Sanchez Charter Coaches. Information on route and schedule is available from anyone who responded to the recent survey or from Bruce at X7841.



## Bus Notes

The first Sandia commuter bus to cross the city limits — those of Albuquerque, Los Lunas, and the Highway 47 communities in between — begins its two-week trial period on Monday. The photo on this page shows the type of bus to be used.

\* \* \* \*

Bus passes for the Sandia Specials are selling well says Credit Union manager Bill Bristol. Two notes: 1. Make checks (\$6 per pass) payable to Sandia Laboratory Federal Credit Union, not just CU, and include your organization and account numbers. 2. Federal regulations prohibit member credit unions from offering services to non-members; the 205 Sandians who don't belong can either a. send a check to Albuquerque Transit, 619

Yale SE, 87108, with a self-addressed envelope, or b. join the Credit Union (that's \$5; use a bus pass every day for 4½ months and you recover more than you invested).

\* \* \* \*

Two hundred twenty three Sandians say they'd ride a Far East bus (along Chelwood Park) at least part of the time, reports Farrell Perdreauxville (5722). Next step is to meet with the City's Department of Transportation, convince them of the demand, arrange for commuter use of already scarce buses, and set a route to serve the maximum number of respondents. All those who replied to the survey will be notified as to route, schedule, and start date.

\* \* \* \*

John Southwick (9532) has heard from about 45 people interested in a Sandia Park/Cedar Crest/Tijeras commuter bus. It will probably be a few weeks until all the replies are tabulated, a carrier contacted, and a trial period can begin. Those who responded will be notified as soon as possible.

## Take Note

Bicyclists — No one likes to cycle into a head wind. Indeed, according to an article on cycles in *Scientific American*, wind resistance varies as the square of the velocity of the wind with respect to the cyclist. So you get up in the morning, notice a breeze, and have to judge whether the Tijeras Canyon/KAFB wind tunnel is working with its customary gusty efficiency before you can decide to cycle or not. Call 243-1371, the number of a recorded weather message originating at the airport. Their report includes wind velocity and direction, is updated at six a.m. and, since it originates at the airport, probably reflects Base conditions pretty well.

\* \* \* \*

At last month's meeting of the International Personnel Management Ass'n., a panel moderated by Bob Garcia (4230) discussed reactions of minorities and women to progress under the EEO Act. Other panelists included Amado Trujillo (5645), Winser Alexander (4752) and Emily Young (5166) representing, respectively, Chicano, Black and female points of view.

\* \* \* \*

Charles Harrison (2126) and co-author R.W.P. King (Harvard Univ.) have won the Best Transactions Paper Award of the Group on Electromagnetic Compatibility of IEEE. The paper, "Excitation of a Coaxial Line Through a Transverse Slot," was judged the outstanding paper in the 1972 Transactions. Harrison and King are the first recipients of this award. An awards ceremony will be held during the 1973 International Symposium on Electromagnetic Compatibility in New York City on June 20.

\* \* \* \*

Ann Michele (7500/3100) is the new president of the New Mexico Division of the National Secretaries Association (International). Her one-year term includes representing the state at the annual convention in Denver in July. Ann has been a member of NSA since 1960.

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## Sandians Receive Degrees

Degrees have been awarded to a large number of Labs employees participating in various Sandia education programs. If we've overlooked you, please call the LAB NEWS office.

### Educational Aids Program:

Marion Apodaca (5313), B.U.S., chemistry, U of A; Raymond Bland (5526), BS, physics, U of A; Ward Bower (2312), BS, EE, UNM; Ronald Carlsten (2523), BS, EE, UNM; Charles Eisenhour (9425), B.U.S., mathematics, UNM; Robert Frazer (9423), BS, EE, UNM; Thomas Howard (2441), BS, EE, UNM; Lyle Kruse (5323), B.U.S., nuclear engineering, UNM; Robert Lederer (9342), BS, mathematics, U of A; Thomas

Looby (1116), BS, ME, UNM; Julian Lovato (4154), BBA, U of A; Margarito Martinez (9486), BS, mathematics, U of A; Timothy Ristine (7624), BS, mathematics, U of A; John Simchock (7613), BBA, UNM; Robert Simpson (2414), BS, EE, UNM; Kip Stanley (7133), BBA, U of A; Jess Tidmore (5313), BS, physics, UNM; Kenneth Young (1112), BS, civil engineering, UNM; Ronald Allred (5314), MS, nuclear engineering, UNM; Stuart Asselin (4760), MS, nuclear engineering, UNM; Eugene Copeland (9343), MA, economics, UNM; Ronald Hall (3141), MS, EE, UNM; Arthur Hardeman (4116), MA, mathematics, UNM; Ray Merrill (5521), MS, chemistry, UNM; William Nelson

(2646), MS, EE, UNM.

### Computer Science Development Program:

Fred James (1244), MS, EE, UNM; John Marcon, Jr. (2134), MS, EE, UNM; George Steigerwald (2126), MS, EE, UNM.

### Doctoral Study Program:

Bennie Blackwell (5628), PhD, ME, Stanford Univ.; Marcus Bunting (4731), PhD, operations research, Northwestern Univ.; David Caskey (2642), PhD, EE, U of Texas; Ned Keltner (9331), PhD, ME, UNM; David Larson (1543), PhD, ME, Mississippi State Univ.; Donald Schroeder (2431), PhD, EE, UNM; Alfred Watts (1255), PhD, EE, Mississippi State Univ.

# A Reply to a Letter to the Editor

(Original Is In Smaller Type)

Dear Editor:

I was a participant in an absolutely ludicrous event at the Coronado Club on the night of Wednesday, May 23rd.

MASTERCARE, which has approximately 2700 Sandia subscribers, is in deep trouble. And about 10 people, other than the 20 who were nominees for the Board of Directors, showed up.

About 10 o'clock, just before we all departed for home, Don Ledden, Administrative Manager of MASTERCARE, gave a speech of righteous indignation. Here's what he had to say to the 2671 Sandians who never showed:

1. I am disappointed that people did not come to the meeting. MASTERCARE is not like an insurance company where you have no access to the Board of Directors. MASTERCARE subscribers can set policy.

We're satisfied with the current policy.

2. People have to use common sense in seeking medical assistance. While we emphasize the preventive aspects in this program, subscribers must use some judgment as to what help is really needed. Where, previously, a mother used to give her child with a temperature an aspirin and keep watch on the situation, she now rushes the child to a doctor.

Can you document this statistically? I doubt if individuals now in MASTERCARE are behaving very differently than when they were under Equitable. I think it's just that all the people on whom Equitable was losing money are now MASTERCARE subscribers and all those on whom Equitable was making money stayed put. The briefing meeting I went to made it perfectly clear that it was to each individual's advantage to change or stay put according to which category he was in. And I noticed that Equitable made no effort to persuade subscribers not to leave. It seemed obvious at the time that MASTERCARE would soon be broke but I assumed that somehow or other you must know what you were doing.

3. Both the doctors and the hospitals are receiving only 70% of their billing costs. How would you like to have your salary reduced by 30%? If utilization of the plan continues this way, you will soon be involved one way or the other.

Having accepted the worst half of Equitable's statistics, you're going to have to live with a high rate of utilization. It's naive to hope otherwise.

4. Your alternatives: Many doctors may drop out if the future promises them only 70% of their normal income. Or, you face the risk of having your benefits reduced. Or MASTERCARE could possibly go out of business.

You seem to be saying that if I don't tell you what to do you'll go blithely into bankruptcy. OK, here's what to do: double my premium! I can calculate well enough to know I'll still be getting a fair deal. Work up the statistics on your first six months of utilization, find out who should be paying more, and ask for it. (Rates should certainly be a stronger function of family size.) I suppose it's illegal to raise premiums the first year; you'll have to go into some form of receivership and convince us that it's "ante up voluntarily or see you die".

5. Subscribers must get involved and find answers to the problems. Utilization has to be such that the program can sustain itself. Those you select as Board Members are going to have a tough job because they are going to have to get you off your collective duffs and into committees to deal with all the problems.

The fact is, the premium structure will be easier to change than the utilization. You'll need some good legal and PR committees.



Kermit Lindell (left) and Ralph Trujillo, both 5252, co-inventors of the new disinfectants, check the formaldehyde solutions for any vapor or odor emission.

## Olfactory Breakthrough

# No-Smell Formaldehyde Discovered

Remember those limp and clammy frogs in your high school biology lab? Their appearance was bad enough, but the smell of the preservative — formaldehyde — was something else. Now research at Sandia has produced an odorless formaldehyde that has the same germ-killing power as the regular stuff. Like ordinary formaldehyde, it is effective against bacteria, fungi, molds and yeasts, and is non-toxic, unless swallowed.

Formaldehyde is made by dissolving paraformaldehyde in water. However, Ralph Trujillo and Kermit Lindell of Sandia's Biosystems Research Department (5250) found that when paraformaldehyde is dissolved in any one of three solvents — ethylene glycol, glycerol or propylene glycol — a vaporless, nearly odorless formaldehyde is produced.

One of the new varieties (glycerol) is completely odorless, and the others have a slightly musty odor. Ralph and Kermit don't know why the odor disappears.

They have, however, determined that the new varieties possess the same disinfectant qualities as regular formaldehyde. Tests are underway to determine if these properties remain constant over a period of time.

Elimination of its undesirable odor and vapor may widen the use of formaldehyde,

6. How are we supposed to communicate with you? Someone said our error was in sending out the notice of the meeting about three weeks in advance. Mailing is expensive. And if we sent it out later that probably wouldn't have been right either. So what do you think we should do?

Level. Tell us that management has goofed and that you want the board of directors to provide *management* as well as policy. Start calling MASTERCARE a *cooperative*. Mailings are not expensive: \$30 for printing plus volunteer addressers and the company mail.

Well, that's essentially what the man said. And I'm sitting here pondering why I care — I'm not even a member of MASTERCARE.

Mary Quigley - 3131

Want to bet she has few medical expenses and is an Equitable subscriber?

Crawford MacCallum - 5223

perhaps making it useful as a household disinfectant, as a fungus proofing for clothing or possibly as a biodegradable insecticide.

The new formaldehydes were discovered during research which Sandia conducted for NASA on methods of sterilizing interplanetary spacecraft. NASA has filed for a patent on the new disinfectants.

Listen To This

## Speaking Is A Learned Skill

Everyone talks. Talk all the time. An endless cacophony of words.

Who says anything worth saying? Who listens?

There is a group of Sandia and AEC people who meet every Wednesday noon at the Coronado Club. Members have things to say and they say them well, while the group pays attention and gives critical review of what has been said.

Developing communication skills is the purpose of the organization. Along the way members have a lot of fun, tell many jokes and enjoy a good feeling about their product — self improvement.

The group is the Beta Aloosters Toastmasters Club, celebrating its 16th anniversary this year. It has given experience to many, many people in the practical art of standing up and talking meaningfully to a group.

"There is only one way you can learn this skill," member Joe Muench (1641) says, "and that is to do it. After a long time, you can become comfortable while doing it, and then, finally, you gain confidence. Talking to a group becomes a means of satisfaction."

Joe describes how much easier it is to give a technical paper at a symposium, give a briefing at work, or speak extemporaneously with the weekly practice at Toastmasters.

"Toastmasters offers a program that teaches you to talk — and to think," Joe says, "this is a testimonial."

The Beta Aloosters are looking for new members. If you're interested call Joe on ext. 5647.



William P. Morales — 7512



Hap Howell — 1133 25

# MILEPOSTS

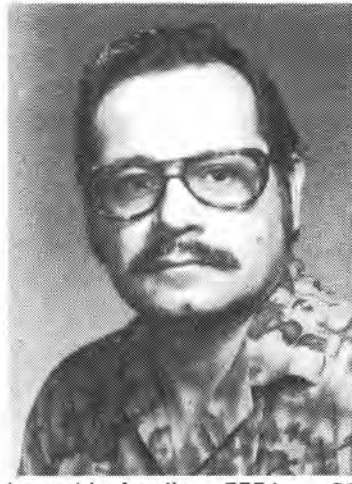
LAB NEWS June 1973



Leonard Parsons — 9524 20



Frank Hudson — 4712 20



Leopoldo Armijo — 7554 20



Lois Mathes — 4213 10



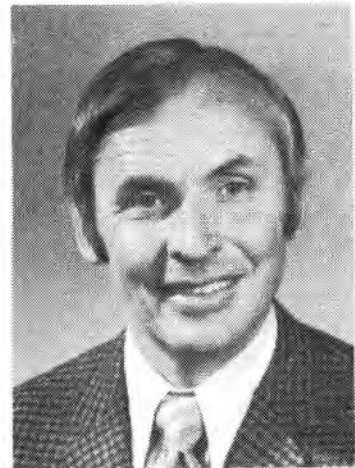
Amy Anez — 9551 15



Hollis Elledge — 7518 15



Parker Jones — 5715 20



James K. Cole — 5644 15



David Saylor — 5122 10



Elsie Harper — 7332 10



Harry Pastorius — 7540 25



Lawrence Gallo — 1231 10



Leo Navoda — 9341 20



Siegfried Thunborg — 5712 20



Chester Fornero — 7333 25





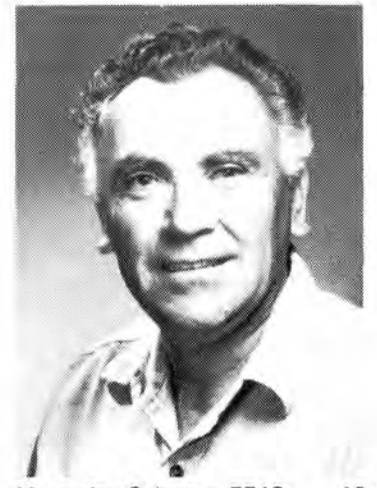
Florence Brewster - 7631 15



Bob Baker - 2111 20



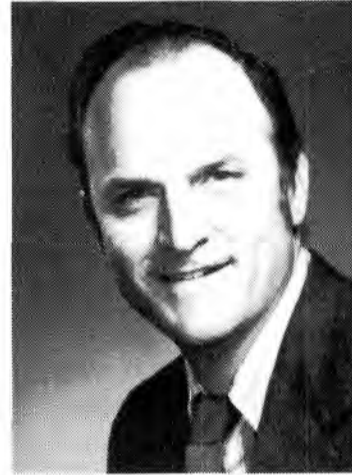
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Margarito Griego - 7518 10



Elvin Beezley - 9443 20



Charles Karnes - 5165 10



Duane De Werff - 2332 10



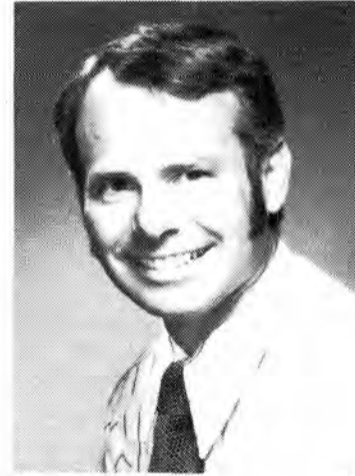
George Arnot - 5642 25



Walter Roose - 3144 10



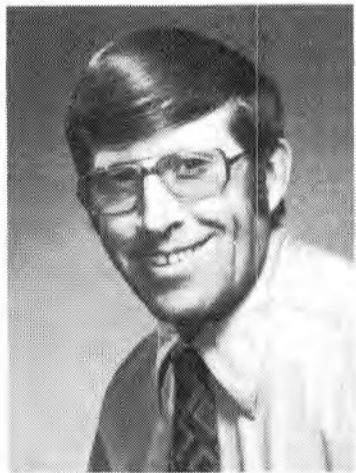
Dorothy Hall - 4230 10



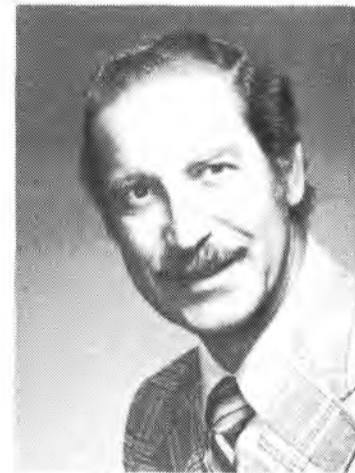
Ron Syler - 1232 15



Wallis Cramond - 1652 10



George Curry - 1133 25



Joseph Teresi - 9514 25



William Colborne - 4110 20



Connie Coalson - 9322 15



Delfinio Jinzo - 7554 25



Vivian Wuttke - 7122 10



Robert Burnett - 2315 20

## FUN & GAMES

The Sandia Labs Bridge Association invites Sandia and AEC bridge players to participate in the annual Open Pairs Duplicate Bridge Tournament. The event will be held at the Coronado Club on June 28 with play beginning at 7 p.m. Call George Arnot (5642), ext. 6600, if you need a partner or want more information.

\* \* \*

**Tennis Players** — When you're playing on the Base tennis courts and you're getting those hard looks from that stern-looking guy on the sidelines, did you think maybe it was your deodorant that had failed you? Not so. He just wants your court — and will probably get it one way or the other. This zinger was recently received from the military: "Special Service Tennis Courts are reserved . . . for active and retired military . . . All other personnel authorized to use athletic facilities may use the courts on a space-available basis. . . . To avoid any conflicts, courts are numbered from west to east. (Ed. note: We have it on good authority that an earlier east-to-west numbering scheme was the occasion of frequent internecine squabbling.) If unauthorized personnel are found on tennis courts, and refuse to leave after requested to do so, the Air Police will be notified." There's more, but the substance of it is that Sandia types, priority-wise, come after everybody except possibly the VC. Oh — if you contemplate a last-ditch stand with the Air Police, let us know. We'd like a few pictures. . .

## Deaths



Jack Miller, a security inspector in organization 9550, died suddenly June 1. He was 46.

He had worked at Sandia since November 1956.

Survivors include his widow, a son and a daughter.

Bill Swiss, a technical writer in Weapon Manuals Division 1611, died June 2 after a short illness. He was 49.

He had worked at Sandia since November 1956.

Survivors include his widow, two sons and a daughter.



J. Frank Schofield, a systems analyst in Administrative Policies and Standards Division 4118, died June 5 after an illness of several months. He was 61.

He had worked at the Laboratories since July 1957.

Survivors include his widow, a daughter and a son.



The SGA Open was held June 2 at Arroyo del Osa and June 3 at UNM. The low gross trophy was won by Wendell Nelson (4142) with a score of 157. The low net trophy went to Ben Chavez (2631) with a 134. Gerry Quinlan (2641) won the A-Flight low net with 136.

The next tournament is the Mid-Season tourney on June 30 on the Arroyo del Oso course. This is a two-man best-ball affair and Bill McAtee (5221) has the details.

\* \* \*

At the regular Chess Club meeting on Monday, June 18, at the Coronado Club, Warren Miller (9425) will lecture on the art of demolishing chess opponents. All are welcome.

Winners of the simultaneous Chess Match held May 21 were Dale Kinabrew and Spencer Lucas.

\* \* \*

Attention runners, joggers, sprinters and shufflers — Dennis Mottern (5533) proposes that a Sandia Runners Association be formed. The loosely knit group would have as members the fairly large number of Sandia and AEC people who run regularly during the noon hour and after work. Dennis estimates

the number as exceeding one hundred. Purpose of the association would be to enhance the entire activity of running and, to this end, such a group could provide:

— accurate maps of various running courses on the Base. Maps would be especially useful when the wind is up and a runner wants to select a course, such as one through a housing area, that offers more shelter.

— quarter or half mile posts around the more popular courses.

— representation in dealings with the military — at various times friction has developed over runners' use of roadway.

— a number of stopwatches that could be checked out.

— an occasional newsletter that would carry map reproductions, information about possible discounts on running shoes and other equipment, the latest on aerobics, e.g. point values of courses adjusted for altitude, running tips, and the like.

— competition, if interest warranted, with open and age-bracket events over various distances.

The Sandia Runners Ass'n would feature no meetings and no dues, Dennis promises. "What's a runner?" we asked. "Oh, let's say anyone who does a mile or more at least a couple times a week," Dennis replied. Send in the coupon below if you qualify.

To: LAB NEWS, 3162  
Please enroll me as a member of the Sandia Runners Association:

\_\_\_\_\_ name \_\_\_\_\_ Sandia/AEC org. \_\_\_\_\_ E. No. \_\_\_\_\_ phone ext.

I usually run \_\_\_\_\_ mile(s) \_\_\_\_\_ times per week.

### Bldg. 802 Exhibit

## Watercolors by Tillie Pierce

The display of large watercolor landscapes of New Mexico now on exhibit in the elevator foyer of Bldg. 802 is the work of Tillie Pierce of Technical Art Division 3155.

The landscapes in the paintings are real — Tillie digs the New Mexico scene and makes sketches as she travels the state. She also uses an Instamatic camera to record detail. Later, she soaks a large sheet of imported watercolor paper in the bathtub, pins it to her easel, and works from the sketches and photos.

In painting watercolors, the background is washed in first and then the foreground goes

on as the paper dries. It is an unforgiving medium. Mistakes can't be painted over, therefore Tillie does a lot of thinking about the painting before she applies a brush.

Tillie has worked at Sandia 10 years. She holds a fine arts degree from Southwest Texas State College and has done advanced work at UNM. Her paintings, both oils and watercolors, have been exhibited at the New Mexico Arts and Crafts Fair, Rio Grande Arts and Crafts Fair and at Southwestern Watercolor Society exhibits.



EXHIBIT of New Mexico landscapes in watercolors now hanging in the elevator foyer of Bldg. 802 is the work of Tillie Pierce of Technical Art Division 3155.

## CU Bulletin Board

Microwave Ovens — April issue of Consumer Reports carries a feature article on microwave ovens. Their overall recommendations: Not recommended. Although all the ovens tested meet the Federal standard of the Bureau of

Radiological Health (1 mw/cm<sup>2</sup> measured at 5 cm from the oven's surface), CR states "we have been unable to uncover any data establishing to our satisfaction what level of microwave radiation emission can unequivocally be called safe." One reason for CR's conservative stand is that evidence has been produced that microwave radiation can damage the eyes in the form of irreversible cataracts.

## Congratulations

To Mr. and Mrs. Randall Cole, Jr. (5223), a son, David Randall, on June 1.

## Sympathy

L.K. Renfro (7515) on the deaths of his father and sister-in-law in Arizona.

Laurie Krebs (3160) on the death of her father in California, June 9.

## JUNK • GOODIES • TRASH • ANTIQUES • KLUNKERS • CREAM PUFFS • HOUSES • HOVELS • LOST • FOUND • WANTED • & THINGS

**CLASSIFIED ADVERTISING**  
Deadline: Friday noon prior to week of publication unless changed by holiday.  
A maximum of 125 ads will be accepted for each issue.

**RULES**

1. Limit: 20 words
2. One ad per issue per person
3. Must be submitted in writing
4. Use home telephone numbers
5. For Sandia Laboratories and AEC employees only
6. No commercial ads, please
7. Include name and organization
8. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

### MISCELLANEOUS

TRAVEL TRAILER, 18' Vista Liner, 1971, self-contained w/all extras, include hitch, jacks, mirrors, for \$2400. Rohde, 298-7322.

DRAFTING TABLE, Mayline, oak, 72"x37 1/2" work surface, \$115; straight edge, K-E, 54", \$20; stool, padded adj. seat & back, \$25. Perryman, 247-8485.

SHOT SHELL reloading equip., scales, powder measure, wads, primers, etc. Baxter, 344-7601.

STROLEE CAR BED; Peterson walker; wooden playpen; baby scales; Cosco infant seat; Playtex baby nurser set. Greenwood, 298-5268.

DARKROOM EQUIP: includes Omega 35mm enlarger & exposure computer. James, 294-6837.

BABY DRESSING TABLE, \$12; 9'x12' beige rug, \$15; infanseat, \$3; deluxe foam bumper pad for crib, \$3; wooden folding gate, \$2. Dahlgren, 298-8168.

8' RAISE-UP KWIK pickup camper w/ice box, stove & water tank, sleeps 2, cabinets & table, \$425. Lackey, 898-5175.

TELEVISION SET, 23" screen, B&W, console, \$45. Saavedra, 256-0333, after 5:30.

YEI NAVAJO RUG, \$185; antique gem 1887 roller organ; several old swords, Grand Rapids Guild twin sofas. Smitha, 266-9977.

LAWN EDGER, electric, 3-wheel, rotary, 10" blades, \$25, cost \$58. Officer, 298-3318.

EAZ-LIFT HITCH 850, sway control, fits Chev. Suburbans, pickups, \$85; Kelsey elec. brake control hydraulic, manual operated, \$13. MacDougall, 299-8496.

FOLD-UP redwood table & benches for indoor-outdoor patios, \$22. Griffin, 298-1174.

GRAPHIC II 4x5 view camera, full sync shutter, triple convertible lens, case, film holders, Polaroid adapter, other items, \$300. Goodwin, 266-6216.

GARAGE SALE: Sat. June 16, 9 a.m. to 5 p.m., 3024 San Pablo NE. Sublett.

LITTLE BROWN "ice chest", all steel, 21" long, 13" high, 12" wide, \$6; 16" alum. ext. ladder, used once, \$14.95. Moyer, 255-8807.

TENT CAMPER, sleeps 4, \$495. Laramore, 299-6941.

'72 BOISE/Cascade Galaxy

mobile home, 14x60, 2-bdr., w/d, AC, ref., gas stove, carpeted, storm wds, awnings, skirting, tie downs, etc. \$8000. McClure, 294-1912.

R/C RADIO SYSTEM, Blue Max, 4-channel Pylon Midget; 4-channel single stick; used less than 10 times, \$175. Krebs, 296-2710.

CHAIN SAW, David Bradley, 26"; single garage door w/hardware; GE Mobilemaid dishwasher; dbl. chest of drawers (8), all white. Salazar, 255-1301.

SAMOYED female puppy, AKC reg., has all shots; Underwood manual typewriter. Morton, 296-6108.

CHILDREN'S pool 10' dia., 2' depth, used 2 seasons, \$10. Lochtefeld, 296-1326.

PAIR citizens band port. transceivers, Midland 2 watt, 3 channel w/crystals, \$53; Argus slide projector, rotary slide carrier, \$12. Womelsduff, 299-6269.

TWO WINDOW model refrigerated air conditioners, 1970 Hotpoint, 10,500 BTU, \$125; 1972 McGraw Edison, 5500 BTU, \$100. Pinkerton, 3816 Anderson Ave. SE.

NEW patchwork quilt, \$25; bronze kitchen stool, \$5; beige ottoman, 23x12, \$5; dog house, alum., \$6; Hankcraft humidifier, \$5. Armstrong, 268-2124.

MEMBERSHIP in Tom Young's spa, pick up payments of \$13/mo. Cowham, 298-4249 after 5:30.

CAR TOP LUGGAGE CARRIER, \$3; Englander hide-a-bed, needs reupholstering, \$65. Eckart, 299-3888.

RABBITS, fryers & does. Robinson, 296-2753.

GARAGE SALE: June 23-24, 1812 Nakomis Ct. NE, rugs, curtains, bedspreads, icebox, lg. live house plants, etc. Hall, 298-6283.

ZIG ZAG sewing machine, attachments, \$50; window AC, 6000 BTU, \$60. Miyoshi, 298-0666.

PUPPIES, mother mostly Collie, free. Stromberg, 255-6131.

BOGEN 120W AMP (2) UTAH columns; Tel-Ray organ tong; Schwinn boy's bike, 3-sp., Sting Ray deluxe; The Great Books, new in boxes; Bar-Bells. Clark, 243-0545.

KITCHEN cabinets & formica counter top w/sink & faucet; also louver door. Chavez, 256-1087.

GAS TANK, 20-gal. cap., off '72 Chevy 1/2-ton carryall, complete w/sender unit, mounting hardware, etc. Harrison, 296-3045.

2-SPEAKERS w/Carlson enclosures, sell or trade for smaller units; Yamaha 250 Enduro, \$410. Watterberg, 294-6759.

CAMERA, Beseler topcon auto 100, 53mm F2 lens, case, filter,

hood, flash, \$90. Parks, 296-2261.

TWO bathroom washbowls w/faucets & mounting hardware, one pink & one blue. Cockrill, 268-5502.

DANISH modern sofa, 2 chairs, coffee & lamp tables, bdr. furniture; dinette set; dishes; pictures; lamps, many other extras. Pickering, 268-2134.

NEW SLALOM water ski, paid \$65; 32 hp Wisconsin air cooled gasoline engine, make offer on either. Zamora, 255-9128 or 268-3187.

HIDE-A-BED mattress & springs, like new but cover worn, \$50. Erickson, 299-6824.

AIR CONDITIONER, refrigeration window-type, Sears Coldspot, 10,200 BTU, used only 3 mos. Auerbach, 296-1489.

HOLLYWOOD TWIN BED, \$25. Ashmore, 268-8304.

GASOLINE lawn mower, \$10. Kent, 4613 Burton SE, 256-1221.

### TRANSPORTATION

'69 KAWASAKI 90cc, needs work, \$45; '72 Nishiki 10-sp., 26" w/lights & many extras, have \$150 in it, asking \$99. King, 298-2991.

*NAMES must appear with all ads as of the 6/29/73 issue. Org. number should accompany each ad but will not be printed. All ads must be submitted in writing — no phone-ins. LAB NEWS.*

BICYCLE, woman's, Schwinn Varsity, bright yellow, brand new. Jenkins, 242-4802.

'72 1/2 TON FORD pickup, 16,000 miles, w/over the cab camper, auto. V8, PS, lg. tires, \$3500. Houghton, 299-3386.

'65 PLYMOUTH, AC, new brakes & battery, \$200. Cowan, 298-3342.

'70 PORSCHE 914/6-6-cyl., 5-sp., AM-FM radio, mags, \$4600. Ray, 281-5598.

'71 HUSQVARNA 400 MX, hooker header, oversize tire, never raced. Honeycutt, 299-7544.

'64 FORD Falcon; '64 Plymouth Valiant; '60 Ford 1/2-ton pickup, all for \$700 or will sell separately. West, 281-3460.

'68 XL FORD, 2-dr. HT, yellow & white, PS, AC, \$1050 or best offer. Rhoden, 294-0619 after 5.

'53 FORD pickup w/camper, 3-sp., 6-cyl., stove & ice box, \$400. Orzel, 268-7837.

GIRL'S 26" BIKE, 1-sp., basket, luggage rack, \$20; 18" reel lawn mower, 4-cycle B&S engine, \$25. Nielsen, 255-2045.

WOMAN'S BICYCLE, Columbia

3-sp., wsw, thornproof, light & rack, used 4 weeks, \$45; Philco stereo, 3-sp., \$20. Guttman, 299-7031.

'71 YAMAHA 250 MX, all the extras, low mileage, fast, \$600. Roth, 877-4997.

'71 VOLKSWAGEN sedan 113, super beetle, \$1650; '71 CL 175 Honda, \$450. Hunke, 281-3819.

'72 CHEV. Blazer, 4wd, 4-sp., 350 V8, PS, stab. hitch channel & ball, positraction, 14 mpg, 20,000 mi., \$3600. Wallis, 281-5361.

'69 FIREBIRD convert., 350 V8, PS, PB, AC, tape deck, \$1250. McDowell, 299-6222.

RALEIGH 5-sp. bicycle, 21" frame, S-A hub, thornproofs, package carrier, \$60; T-Bar frame & pack, \$8. Lipkin, 296-1840.

GIRL'S BIKE, 26" Schwinn Breeze, practically new, saddle bags included, \$65. Arthur, 256-7359.

'65 JEEP, 4-wd, 1/2-ton pickup, 3-sp., 2-sp. transfer case, new tires, new trans., vinyl shell. Ray, 255-1755.

'66 FORD Fairlane 500, 8-track stereo w/base 48 speakers, Hurst Indy shifter auto. trans., 14" chrome rims, 289 cu. in. eng., factory air, \$700. Fitzgerald, 296-1341 8 a.m. to 2 p.m.

DUNE BUGGY, 50 HP Volkswagen engine, fiberglass body, chrome wheels, convert. top, Tonneau cover, tow bar, roll bar. Kroth, 268-4661.

BIKE, 16" girl's, Sears heavy quality std. style, blue & silver, \$25. Anderson, 299-7782.

'66 MUSTANG convert., 289, 4-sp., near new radial tires, \$750. Reed, 299-7425.

'65 FORD CUSTOM 2-dr., 352 V8, PS, factory AC, 69,000 miles. Butcher, 298-8583.

HOLIDAY 20' vacationer, fully self-contained travel trailer, sleeps 4, w/Reese hitch & stabilizer, \$3095. Zucuskie, 268-1929.

BIKE, Schwinn Varsity, 10-sp., blue, chrome fenders, 20", \$60. McClure, 298-4027.

### WORK WANTED

CLASSICAL & FOLK guitar lessons, 8 yrs. study with Hector Garcia; class or private lessons. Felicity Muench, 867-5509.

BEGINNING piano taught by qualified teenager, \$1.50 per half hour, references available. 296-7062.

BEGINNING tennis, private lessons, \$1 per half hour, taught by qualified teenager. 296-7062.

YARD work and/or house painting. Hodyke, 242-1665.

WILL TUTOR elementary or junior high students, all subjects, \$1.50 hour. Graham, 268-7120.

### REAL ESTATE

ACRE LOT, 5 miles south of 66 on 217, view, \$1500, terms. Brown, 296-5949.

4-BDR. house, lg. den, 2 fireplaces, concrete driveway, fenced backyard, 1-3/4 baths. 1813 Blume NE. Farley, 298-0208.

1/2-ACRE LOTS, in approved subdivision, ok for mobile homes, electricity available. 1/2 mile east of Peralta, low down, terms. Shuman, 869-2618.

3-BDR., DR, LR, CFA, AC, FP, 1-3/4 bath, 1538', owner will refinance VA, Conv. or cash to 5 1/4% loan. 10813 Princess Jeanne NE. Wetherholt, 299-5736.

### WANTED

TRANSMISSION for 1964 Triumph Spitfire, will take best offer. Yanez, 296-0804.

SHOP MANUAL to include 1960 Volkswagen. Sample, 296-1771.

BLANKETS, quilts, sleeping bags in any condition are needed by Ski Patrol for injured skiers. Drop off in LAB NEWS office, 802/100.

SWAP antique clocks for pool table or guns. Flowers, 281-3458.

USED STEREO turntable. Roth, 877-4997.

2 or 3 PERSONS to participate in 9-day Grand Canyon river trip w/experienced guide. Begins July 31, cost \$275. More into call Len Kracko, 299-1030 or Jim Lee, 281-5496.

TO CREATE OR JOIN Santa Fe-Albuquerque car pool. Work hours, 7:45-4:45. Spath, 264-6965 or Santa Fe 982-9383.

### FOR RENT

HOUSE, downtown area, at 724 Roma NW, 2-bdr., lg. kitchen, stove & refrig., carport, \$90/mo., water & sewer pd. 242-9601.

SECLUDED MT. HOME, modern 3-bdr., on Abq. phone exchange, stove & refrig., pasture extra, 20 miles from city, \$150/mo. Farmer, 255-2580.

1973 DODGE motorhome, self-contained, many extras, daily or weekly rates. Fox, 299-5736, 266-6606.

### LOST AND FOUND

LOST — Personalized checks in checkbook cover, Officers Club charge card, 4 keys (VW) in black leather case, black leather wallet w/driver's license & Sandia ID inside. LOST AND FOUND, tel. 264-3441, Bldg. 832.

FOUND — Lady's pink scarf, 15-yr. Sandia tie clasp. LOST AND FOUND, tel. 264-3441, Bldg. 832.



## Get Luau Tickets Now

**HAPPY HOURS** — Tonight, a super Latin buffet a la Jim Schultz, Club manager and master chef, Rhythmaires play for dancing, Denny Gallegos and guitar in main lounge. June 22 — A new idea in buffets will be tested. Try an old-fashioned picnic spread featuring fried chicken, baked beans, cole slaw and other goodies for an inside-outside party. The Wildman Bob Banks will be on the bandstand and Yolanda Adent in the main lounge. June 29 — Seafood will be the buffet feature, Frank Chewiwie will play for dancing and Barbara Clark will be in the main lounge.

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**TOMORROW** is the deadline to pick up tickets for the annual Coronado Club Luau. As in the past, this will be one of the big parties of the year — fantastic Polynesian food, music by Ernie and the Hawaiian Saints, entertainment by a dozen performers in the Likolehua Review as well as grass skirts, sarongs and wild outfits. It's set for

### SWIMMING SAFETY



FELIX TORRES

2 FT



LOOK BEFORE YOU LEAP....!



DUST OFF your sarongs, grass skirts, short shorts, 1-piece bikinis, etc. and have them ready for the Coronado Club Luau June 23. Deadline for picking up tickets is tomorrow. Bill Shurtleff (9344) helps Denise Orwig with her costume.

Saturday, June 23, with the fun starting at 6 p.m. with exotic cocktails in pineapples, etc. Tickets are \$4.25 for members, \$5.25 for guests. Pick them up tomorrow at the latest.

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**TEENAGERS** will gather tomorrow night from 7:30 to 10:30 for their monthly go-go bash. Magic Sam will be wired into the bandstand while Hank Stone from KQEO keeps things stirred up. Member parents should pick up tickets for their youngsters.

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**REPLACING SOUL SESSIONS** once a month on the Club calendar are Saturday

Sessions, but the idea is the same — great music, Happy Hour bar prices and free admission for members. Only the kind of music will vary. The first one is set for Saturday, June 30, with the Shilohs (formerly Country Images) booked to play for dancing from 8 p.m. to midnight.

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**SLIDES, MOVIES and PRINTS** taken by Club members during the recent package tour to Rio will be shown at the Club on Tuesday, June 19, starting at 7:30 p.m. Bud Wheeler (4256) invites everyone to share the highlights of the trip. In addition, Bud will talk about upcoming Club tours and the Club's travel program. Happy Hour prices will be in effect.